IN THE CLAIMS:

1. (Previously Presented) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

a chamber heater provided adjacent said humidification chamber and adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber ~~means~~ to convey said gases flow to said patient or other person in need of such gases, and

a humidity sensor configured to provide an indication of the absolute humidity of said gases flow at least at one of said humidification chamber and at a point along said conduit in said gases flow,

a controller or processor configured or programmed to receive as inputs said indication of the absolute humidity of said gases flow, estimate a rate of condensation of said gases in said conduit based on said inputs and control said chamber heater based on said rate of condensation to minimise condensation of said gases in said conduit.

2. (Previously Presented) A humidification apparatus as claimed in claim 1 wherein said conduit includes conduit heater to heat said gases flow, and said controller or processor is configured to control said conduit heater based on said rate of condensation to minimise condensation of said gases in said conduit.

3. (Previously Presented) A humidification apparatus as claimed in claim 2 wherein said humidity sensor including a first absolute humidity sensor in substantial proximity to said outlet of said humidification chamber.

4. (Previously Presented) A humidification apparatus as claimed in claim 3 wherein said conduit having a patient end, distal to said end connected to said outlet of said humidification chamber, and said humidity sensor further comprising a second absolute humidity sensor in substantial proximity to said patient end of said conduit.

5. (Previously Presented) A humidification apparatus as claimed in claim 4 wherein said estimate of the rate of condensation is based on the difference between the absolute humidity at said outlet of said humidification chamber, as indicated by the output of said first absolute humidity sensor, and the absolute humidity at said patient end of said conduit, as indicated by the output of said second absolute humidity sensor.

6. (Cancelled)

7. (Previously Presented) A humidification apparatus as claimed in claim 5 wherein said controller or processor is configured to:

i) energise said conduit heater depending on at least said estimate of the rate of condensation, to a level appropriate to substantially vaporise any liquid condensate present in said conduit; and

ii) energise said conduit heater depending on at least said estimate of the rate of condensation, to a level appropriate to minimise any condensation of the vapour from said gases in said conduit.

8. (Currently Amended) A humidification apparatus as claimed in claim 7 wherein said steps (i) and (ii) are repeated continually at regular intervals.

9. (Original) A humidification apparatus as claimed in claim 7 wherein said steps (i) and (ii) are alternated at regular intervals.

10. (Currently Amended) A humidification apparatus as claimed in claim 2 wherein said conduit having a patient end, distal to said end connected to said outlet of said humidification chamber ~~said humidity sensor comprising~~ and said apparatus further comprising a first temperature sensor in substantial proximity to said outlet of said humidification chamber and an absolute humidity sensor in substantial proximity to said patient end of said conduit.

11. (Previously Presented) A humidification apparatus as claimed in claim 10 further comprising conduit heater adapted to heat said gases flow in said conduit and/or said conduit, and said controller or processor configured to energise said conduit heater depending on at least said estimate of the rate of condensation, at a level appropriate to minimise any condensation of the vapour from said gases in said conduit as well as convey said gases flow to said patient or other person in need of such gases substantially at a predetermined level of absolute humidity.

12. (Currently Amended) A humidification apparatus as claimed in claim 2 further ~~wherein said humidity sensor~~ comprising at least a temperature sensor and at least one relative humidity sensor providing an indication of the temperature and relative humidity at least at one point in the flow path of said gases flow through said apparatus.

13. (Original) A humidification apparatus as claimed in claim 2 wherein further comprising flow sensing means adapted to provide an indication of the rate of flow of said gases flown through said apparatus.

14. (Original) A humidification apparatus as claimed in claim 13 wherein said flow sensing means comprising a heated element adapted to maintain a substantially constant temperature and being provided in the flow path of said gases through said apparatus, the heat loss therefrom providing an indication of the rate of flow of said gases.

15. (Currently Amended) A humidification apparatus as claimed in claims 1 or 2 wherein said humidity ~~sensing means~~ sensor further comprising a disposable cover ~~means for~~ providing a substantial barrier to microorganisms between said flow of gases and said ~~temperature~~ humidity sensor.

16. (Currently Amended) A humidification apparatus as claimed in claims 1 or 2 wherein said humidity ~~sensing means~~ sensor further comprising porous disposable cover means for providing porous material as a substantial barrier to microorganisms between said flow of gases and said absolute humidity sensor.

Claims 17-32 (Canceled)

33. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber including wet heating means adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber and dry heating means adapted to directly heat said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, ~~as claimed in claims 17 or 18 wherein said gases transportation pathway means includes~~ including insulation ~~means adapted~~ to minimise the rate of heat energy lost by said gases flow in said conduit ~~gases transportation pathway means~~,

a controller configured to energise said wet heating means and said dry heating means to achieve a desired level of absolute humidity ~~said control means adapted to energise said chamber heating means~~ and to minimise the condensation of the vapour from said gases in said conduit ~~gases transportation pathway means while providing predetermined levels of absolute humidity~~.

Claims 34-35 (Canceled)

36. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially coincide with a predetermined profile, ~~as claimed in claim 34~~ wherein said regulated conduit ~~heating means~~ heater comprising at least one section of negative temperature coefficient material wherein the localised electrical resistance of said section is negatively related to the localised temperature.

37. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially coincide with a predetermined profile ~~as claimed in claim 34~~ wherein said regulated conduit ~~heating means~~ heater comprising a plurality of sections of positive temperature coefficient material wherein the localised electrical resistance of each said section is positively related to the localised temperature section and at least two electrical conductors running along said ~~gases transportation pathway means~~ conduit, each said conductor being electrically connected to a separate portion of each said section and each said section being electrically isolated from all other sections except for the connection through each said conductor.

38. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially coincide with a predetermined profile ~~as claimed in claim 34~~ wherein said ~~gases transportation pathway means~~ conduit further comprising an inspiratory conduit ~~means~~ in fluid communication with said outlet of said humidification chamber, a connector ~~means~~ in fluid communication with said inspiratory

conduit ~~means~~, a flexible tube extension ~~means~~ in fluid communication with said connector ~~means~~ and a patient interface ~~means~~ in fluid communication with said flexible tube extension ~~means~~ adapted to convey said gases flow to said patient.

39. (Currently Amended) A humidification apparatus as claimed in claim 38 wherein said flexible tube extension ~~means~~ including a flexible tube extension ~~heating~~ heater ~~means~~ with at least one section of positive temperature coefficient material wherein the localised electrical resistance of said material is positively related to the localised temperature

40. (Currently Amended) A humidification apparatus as claimed in claims 38 or 39 wherein said patient interface ~~means~~ comprising a patient interface ~~heating~~ heater ~~means~~ including at least one section of positive temperature coefficient material wherein the localised electrical resistance of each said section of said material is positively related to the localised temperature.

41. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially to coincide with a predetermined profile ~~as claimed in claim 34~~ further comprising a humidity ~~sensing~~ sensor ~~means~~ for providing an indication of the absolute humidity of said gases flow at said outlet of said ~~humidity~~ humidification chamber ~~means~~.

42. (Currently Amended) A humidification apparatus as claimed in ~~claims~~ claim 41 ~~wherein~~ further comprising a temperature ~~sensing~~ sensor ~~means~~ for providing an indication of the temperature of said gases flow at said outlet of said ~~humidity~~ humidification chamber ~~means~~.

43. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially coincide with a predetermined profile ~~as claimed in claim 34~~ wherein said ~~gases transportation pathway means~~ conduit comprising a double walled inspiratory conduit and said regulated conduit ~~heating~~ heater

~~means~~ comprising the provision of warm fluid circulated between the inner wall and outer wall of said double walled inspiratory conduit.

44. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

chamber heater provided adjacent said humidification chamber adapted to vaporise liquid water in said humidification chamber in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a regulated conduit heater adapted to regulate the temperature profile of said gases flow along said conduit and/or of said conduit, to substantially coincide with a predetermined profile ~~as claimed in claims 34~~ wherein said predetermined profile relates to a substantially constant temperature along the length of said ~~gases transportation pathway means~~ conduit.

45. (Withdrawn) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

humidification chamber means and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber means,

chamber heating means provided adjacent said humidification chamber means and adapted to vaporise liquid water in said humidification chamber means in order to provide water vapour to said gases flow passing through said humidification chamber means, and

chamber manifold means including mounting means in use housing at least one sensing means in proximity to said outlet of said humidification chamber means to connect:

said inlet of said humidification chamber means to a supply conduit means, said supply conduit means in use in fluid communication with a gases supply means for supplying said gases flow at a desired pressure, and/or

said outlet of said humidification chamber means to a gases transportation pathway means for conveying said gases flow to said patient or other person in need of such gases.

46. (Withdrawn) A humidification apparatus as claimed in claim 45 wherein said chamber manifold means further including chamber manifold heating means adapted to heat said gases flow through said chamber manifold means and/or said chamber manifold means.

47. (Withdrawn) A humidification apparatus as claimed in claims 45 or 46 wherein said chamber manifold means is attachable to and removable from said humidification chamber means.

48. (Currently Amended) A method for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

transferring water vapour or humidity to gases passing through a chamber,

conveying said gases flow to said patient or other person in need of such gases from said chamber, and

sensing the absolute humidity of said gases flow ~~at lease one~~ at one point along its flow path,

estimating a rate of condensation of said gases based on said absolute humidity and controlling the transferred humidity based on said rate of condensation to minimise condensation of said gases.

49. (Previously Presented) A method as claimed in claim 48 further comprising the step of heating said gases flow at least at one point along its flow path, and controlling the transferred heat based on said rate of condensation to minimise condensation of said gases.

50. (Currently Amended) A method as claimed in claim 49 wherein said absolute humidity is sensed in substantial proximity to ~~said outlet of~~ said chamber.

51. (Previously Presented) A method as claimed in claim 50 wherein said absolute humidity is also sensed in substantial proximity to a patient.

52. (Previously Presented) A method as claimed in claim 51 wherein said estimate of the rate of condensation is based on the difference between the absolute humidity at said outlet of said chamber, and the absolute humidity at said patient.

53. (Previously Presented) A method as claimed in claim 52 further comprising the steps of:

i) heating said gases flow depending on at least said estimate of the rate of condensation, to a level appropriate to substantially vaporise any liquid condensate; and

ii) heating said gases flow depending on at least said estimate of the rate of condensation, to a level appropriate to minimise any condensation of the vapour from said gases.

54. (Previously Presented) A method as claimed in claim 53 said steps (i) and (ii) are repeated continually at regular intervals.

55. (Previously Presented) A method as claimed in claim 53 wherein said steps (i) and (ii) are alternated at regular intervals.

56. (Previously Presented) A method as claimed in claim 49 wherein the temperature of said gases is sensed in substantial proximity to the outlet of said chamber and the absolute humidity is sensed in substantial proximity to said patient.

57. (Previously Presented) A method as claimed in claim 56 further comprising the steps of heating said gases, and controlling the transferred heat depending on at least said estimate of the rate of condensation, at a level appropriate to minimise any condensation of the vapour from said gases as well as convey said gases flow to said patient or other person in need of such gases substantially at a predetermined level of absolute humidity.

58. (Previously Presented) A method as claimed in claim 49 wherein the temperature and relative humidity at least at one point in the flow path of said gases flow is sensed.

59. (Currently Amended) A humidification apparatus for humidifying a gases flow to be supplied to a patient or other person in need of such gases comprising:

a humidification chamber and having an inlet and an outlet to allow said gases flow to pass through said humidification chamber,

a chamber heater provided adjacent said humidification chamber and adapted to vaporise liquid water in said humidification chamber ~~means~~ in order to provide water vapour to said gases flow passing through said humidification chamber,

a conduit connected to said outlet of said humidification chamber to convey said gases flow to said patient or other person in need of such gases, and

a humidity sensor configured to provide an indication of the absolute humidity of said gases proximate said outlet,

a controller or processor configured or programmed to receive as inputs said indication of the absolute humidity of said gases flow, and energise said chamber heater based on said absolute humidity to achieve a predetermined absolute humidity at said outlet, and ~~configure~~ configured or programmed to vary ~~such that~~ said predetermined absolute humidity to substantially ~~avoiding~~ avoid condensation in said conduit.